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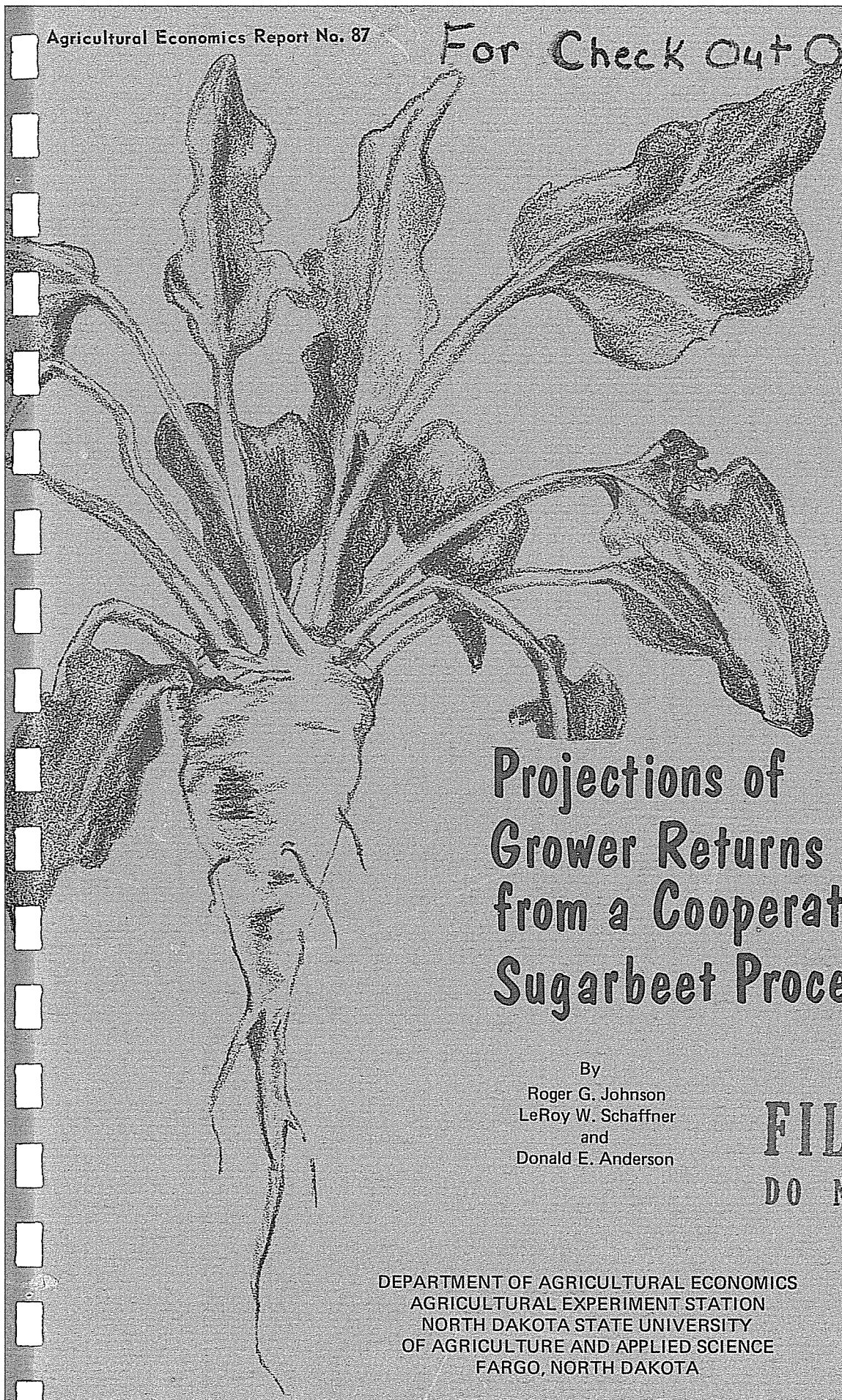

Projections of Grower Returns from a Cooperative Sugarbeet Processing Plant

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PROJECTIONS OF GROWER RETURNS FROM A COOPERATIVE SUGARBEET PROCESSING PLANT

Roger G. Johnson, LeRoy W. Schaffner, and Donald E. Anderson

This report analyzes the economic impact on the farm producer of the sugarbeet plant being planned by the Red River Valley Cooperative, Inc., at Hillsboro, North Dakota. The proposed financing of the plant involves an investment in the plant by the sugarbeet producer. A portion of the amortization of the plant cost will be accomplished through a reduction from the price paid for the sugarbeets. This report evaluates the economic effect of the producer financing on the cash flow and net returns of the participating farmers.

Financial Plan for Sugarbeet Processing Plant

The sugarbeet plant will be designed to handle the production from 50,000 acres. Projecting an average yield of 12.5 tons per acre results in a total of 625,000 tons processed per year. The capital outlay for the factory, including working capital requirements, is $32,000,000. A breakdown of these costs is as follows:[1]

Cost of Factory

Site	$ 120,000
Construction Contract	27,607,000
Sugar Storage (2nd)	1,100,000
Interest During Construction	658,945
Start Up Costs	514,055
Working Capital Needs	2,000,000
	$32,000,000

The proposed funding for this investment involves a combination of a stock investment by growers of $165 per acre of beets plus loans from several sources. The funding is summarized as follows:[2]

Beet Growers Stock Purchases	$ 8,250,000
St. Paul Bank for Cooperatives (15 years)	19,200,000
Bank of North Dakota (15 years)	3,750,000
BMA, Contractor for Plant (6 years)	800,000
	$32,000,000

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*Johnson and Schaffner are Associate Professors and Anderson is a Professor, Department of Agricultural Economics, North Dakota State University, Fargo, North Dakota.

[1] Red River Valley Cooperative, Inc., Hillsboro Beet Sugar Factory Projections (prepared--May, 1972).

[2] Ibid.

The funds for repayment of the loans will be generated from the operation of the plant. However, because of the rapid rate of depreciation used, it is projected that the plant would operate at a loss for the first three years of operation if current competitive prices are paid producers for their sugarbeets.[3] In order to prevent a net loss from occurring the price paid producers will be reduced sufficiently for the factory to cover all costs including the accelerated depreciation charge. Because depreciation exceeds the principal payments, additions are made to the working capital of the cooperative during this period.

The estimated competitive price for sugarbeets and the reduction to cover plant loss are shown in Table 1.

TABLE 1. GROWER PRICE PROJECTIONS FOR FIRST FOUR YEARS OF OPERATION OF COOPERATIVELY OWNED SUGARBEET FACTORY

	Year of Operation			
	1st Year	2nd Year	3rd Year	4th Year
Competitive Price for Sugarbeets Per Ton	$15.54	$15.54	$15.54	$15.54
Reduction to Cover Factory Loss	1.11	.60	.08	--
Price Received by Grower	14.43	14.94	15.46	15.54
Government Payment	2.25	2.25	2.25	2.25
TOTAL PRICE	$16.68	$17.19	$17.71	$17.79

The factory loss figures shown in Table 1 and subsequently used to derive farmer prices for beets throughout the analysis are based on estimates made by the Red River Valley Cooperative and likely may deviate from the projected levels. The producer should recognize that the price level he receives for beets bears the added risk of annual fluctuations in plant operating costs and marketing costs which expose the grower to some added risks particularly during the early years of plant operations.

The current plan calls for the plant to be ready to process the 1974 sugarbeet crop. The farmers' $165 per acre investment is scheduled in two installments. Forty percent will be due July 1, 1972, and the balance is due March 1, 1973. The proposed schedule for payment for delivery of the first crop of sugarbeets is as follows:

November-December	1974	75%
April	1975	10%
September	1975	Balance

It should be noted that the farmers' investment is made from 21 to 29 months before the first sugarbeet payment is received. At an 8 percent annual interest rate total interest cost until the first sugarbeet payment is received is $26.62 per acre. For a 200-acre allotment this interest totals $5,324.

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[3] Ibid.

Banks, Production Credit Associations, and other financial institutions have been giving letters of capital commitment to growers for the $165 per acre investment. This capital commitment is often with the understanding that a $2 per ton assignment on the sugarbeet crop will be taken. Based on the timing of the farmers' investment, an 8 percent interest rate, a 12.5 ton yield, and a $2 per ton repayment rate would amortize the loan in approximately 11 years. Not all producers will have to borrow all of the $165 per acre investment. The amount borrowed and the repayment terms will vary among producers and their credit agency. The analysis which follows will, however, assume a $2 per ton payment to the farmer's credit agency.

In summary, the total per acre and per ton annual cash commitment by the producer is projected to be as indicated in Table 2.

TABLE 2. CASH COMMITMENT OF PRODUCER FOR FIRST FOUR YEARS TO FINANCE SUGARBEET PROCESSING PLANT

	Year of Operation							
	1st Year		2nd Year		3rd Year		4th Year	
	Per Ton	Per Acre	Per Ton	Per Acre	Per Ton	Per Acre	Per Ton	Per Acre
Repayment of Loan to Purchase Capital Stock	$2.00	$25.00	$2.00	$25.00	$2.00	$25.00	$2.00	$25.00
Reduction in Price to Cover Plant Loss	1.11	13.87	.60	7.50	.08	1.00	--	--
TOTAL	$3.11	$38.87	$2.60	$32.50	$2.08	$26.00	$2.00	$25.00

Investment Needs for Sugarbeet Production

Farmers going into sugarbeet production will have to purchase specialized equipment for the crop. Since the sugarbeets will replace a crop presently being produced, the farmer will normally have sufficient tractors and general tillage equipment to handle this enterprise. Although used equipment represents an alternative that farmers should consider, this analysis assumes new equipment because sufficient used equipment would likely not be available.

Sugarbeet production is currently changing from the use of hand labor for thinning and weeding to the use of mechanical thinners and chemical weed control, so this report will consider three methods of production. The first represents hand labor for both thinning and weeding. The second assumes mechanized thinning plus hand weeding. The third method assumes mechanized thinning and chemical weed control with no hand labor. Table 3 presents the additional investments needed for a 200-acre sugarbeet enterprise for each of three methods of production. New investment needs for a 130-acre allotment are presented in Appendix Table 1.

Only two-thirds of a 4-row sugarbeet lifter has been budgeted. The capacity of a 4-row lifter is estimated to be 300 acres. Therefore, only two-thirds of a lifter would be needed for a 200-acre allotment. Share ownership or custom work would have to be used to cover the other third of the lifter investment.

TABLE 3. ADDITIONAL INVESTMENT FOR A 200-ACRE SUGARBEET ALLOTMENT UNDER THREE METHODS OF PRODUCTION[a]

Item	Hand Labor	Thinner and Hand Labor	All Mechanized
Planter--12-row	$ 3,375	$ 3,375	$ 3,375
Cultivator--12-row	1,962	1,962	1,962
Rotobeater--Scalper	3,255	3,255	3,255
Mechanical Thinner--6-row	--	7,493	7,493
Lifter 2/3 Share--4-row	5,236	5,236	5,236
Land Leveler 1/4 Share--40 ft.	626	626	626
Truck--2 1/2 Ton Tandem (value of a $1,000 trade-in is deducted from the price)	10,037	10,037	10,037
Housing for Migrant Labor	3,400	3,400	--
TOTAL	$27,891	$35,384	$31,984

[a]The investments presented assume new equipment and are based on list prices from Fargo dealers less a discount of from 5 to 15 percent. This represents the normal discount farmers are able to obtain with no trade-in.

One-fourth of the cost of a land leveler is charged to the sugarbeet enterprise. This piece of equipment will benefit other crops in the rotation and would have the capacity to handle more than 200 acres per year.

There will be need for additional trucks in addition to specialized sugarbeet equipment. The average grower with a 200-acre allotment uses three trucks for hauling sugarbeets.[4] It will be assumed that the farmer presently has one truck suitable for sugarbeet hauling and one truck will be either custom hired, rented, or obtained through share work with another sugarbeet producer. One additional truck will have to be purchased. This truck will obviously also be used for hauling other crops and is assumed to replace an older truck presently on the farm. (The $1,000 trade-in shown in Table 3.)

Housing for migrant labor will have to be provided except for the all mechanized system. The figure given is the average amount invested in housing by a group of growers surveyed in 1970.[5] The amount actually invested will vary greatly depending upon the availability of suitable housing in the immediate vicinity and the type of hand labor used. A few producers may utilize high school student labor, eliminating the need for migrant labor housing.

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[4]Hofstrand, Donald M. and Dale O. Anderson, Sugarbeet Production Practices and Resource Requirements for the Red River Valley, Agricultural Economics Report No. 85, Department of Agricultural Economics, North Dakota State University, Fargo, May, 1972.

[5]Reff, Tommy, Sugarbeet Applied Research Study, mimeographed report, North Dakota Extension Service, Fargo, November, 1971.

Sugarbeet Costs and Returns

Production Costs

Production costs for the sugarbeet enterprise in the Red River Valley are presented in Table 4. Since nearly all sugarbeets are produced on summer-fallowed land, the costs presented include the cost of an acre of summer fallow in addition to an acre of sugarbeets. The costs given assume 200 acres of sugarbeets on the farm and are based upon recent studies of sugarbeet production costs and practices.[6,7,8,9]

Costs are presented for three levels of utilization of hand labor. Costs have been divided between direct cash costs and fixed costs. The fixed items are depreciation and interest costs associated with investment in machinery and buildings plus the land used in sugarbeet production. The operator's own labor is another fixed cost that is involved. Operator labor is presented in terms of hours rather than as a cost since it is not paid, but rather receives the net returns as its payment.

Production costs are $7.25 per acre lower for the all mechanized system than the method using hand labor. However, it must be recognized that the all mechanized system requires relatively weed-free land and proper techniques in the application of chemicals. Weather conditions may result in inadequate chemical weed control in certain years.

Sugarbeet production costs for a 130-acre allotment are presented in Appendix Table 2.

Returns from Sugarbeets

Gross income depends upon the sugarbeet yield and the price received. An average yield of 12.5 tons per acre will be used. This is the five-year average yield, 1967-1971, per planted acre in the ten counties of Cass, Traill, Grand Forks, Walsh, and Pembina in North Dakota and Clay, Norman, Polk, Marshall, and Kitson in Minnesota. Average yield per planted acre by counties by year are presented in Appendix Table 3.

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[6]Hofstrand and Anderson, op. cit.

[7]Reff. op. cit.

[8]Hofstrand, Donald M. and Dale O. Anderson, "Sugarbeet Production Costs and Practices in the Red River Valley," North Dakota Farm Research, Vol. 27, No. 6, July-August, 1970, North Dakota Agricultural Experiment Station, Fargo, pp. 3-5.

[9]Hofstrand, Donald M. and Dale O. Anderson, "Sugarbeet Production--Effects of Selected Characteristics on Production Costs and Investment Requirements," North Dakota Farm Research, Vol. 28, No. 2, November-December, 1970, North Dakota Agricultural Experiment Station, Fargo, pp. 9-11.

TABLE 4. PRODUCTION COST PER ACRE FOR A 200-ACRE SUGARBEET ENTERPRISE, RED RIVER VALLEY OF NORTH DAKOTA AND MINNESOTA[a]

Cost Input	Hand Labor	Thinner and Hand Labor	All Mechanized
Direct Cost			
Seed	$ 3.75	$ 3.75	$ 3.75
Fertilizer	8.30	8.30	8.30
Chemicals	4.45	4.45	15.80
Hired Labor ($2/hour)	8.85	9.95	10.05
Contract Labor	26.50	12.00	0.00
Machine Repair			
Fallow Year	1.95	1.95	1.95
Crop Year	5.00	5.50	5.65
Fuel, Grease, and Oil			
Fallow Year	1.30	1.30	1.30
Crop Year	7.90	8.45	8.60
Custom and Lease Cost	3.30	3.30	3.30
Building Repair and Utilities	.75	.75	0.00
Miscellaneous	4.75	4.75	4.75
Interest on Operating Capital (8%)	3.15	2.65	2.60
TOTAL DIRECT COSTS	$ 79.95	$ 67.10	$ 66.05
Fixed Cost			
Machinery Depreciation			
Fallow Year	$ 1.70	$ 1.70	$ 1.70
Crop Year	8.00	14.00	14.20
Machinery Interest on Investment			
Fallow Year	2.05	2.05	2.05
Crop Year	6.50	8.40	8.55
Housing Ownership	1.60	1.60	0.00
Land Charge (2 acres)	40.00	40.00	40.00
TOTAL FIXED COST	$ 59.85	$ 67.75	$ 66.50
Cost of Production[b]	$139.80	$134.85	$132.55
Hours of Operator Labor	2.75 hr.	2.75 hr.	2.75 hr.

[a]Includes one acre of sugarbeets and one acre of summer fallow.

[b]Does not include cost of the operator's own labor.

Producer price used in this analysis is based on current price levels for wholesale sugar in the Chicago market area less estimated marketing costs expected to be incurred. The price of sugar is related to a "target price," which in prior years has been established by the Secretary of Agriculture. The

Sugar Act of 1971, however, has tied the "target price" to a formula relating sugar prices to the index of prices paid by farmers (parity index) and the consumer wholesale price index.[10] It is, therefore, reasonable to expect that sugar prices will continue to rise as long as inflation continues to exist in the United States economy.

Returns and costs for each system of production are summarized in Table 5. The returns to operator labor and management are for a direct labor input by the farmer of 2.75 hours per acre. It is emphasized that the costs and returns presented represent costs for sugarbeets produced on fallowed land. Total return to operator's labor and management have been divided by two to indicate the return per acre of land.

TABLE 5. SUGARBEET PRODUCTION COSTS AND RETURNS FOR ONE ACRE OF SUGARBEETS AND ONE ACRE OF SUMMER FALLOW, THREE METHODS OF PRODUCTION, BASED ON A 200-ACRE ALLOTMENT, RED RIVER VALLEY

Gross Income	12.5 Tons @	$17.79[a] =	$222.37
Method of Production	Hand Labor	Thinner and Hand Labor	All Mechanized
Direct Costs	$ 79.95	$ 67.10	$ 66.05
Return Over Direct Costs	142.42	155.27	156.32
Fixed Costs	59.85	67.75	66.50
Labor and Management Return			
Total (2 acres)	82.57	87.52	89.82
Per Acre of Land	41.28	43.76	44.91
Hours of Operator Labor	2.75 hr.	2.75 hr.	2.75 hr.

[a]Price based on current sugar prices.

During the first three years of operation of the cooperatively owned plant grower returns will be less because of the reduction in price needed to cover projected factory losses. Costs and returns for the hand labor method of production are presented in Table 6 for the first, second, and fourth year of factory operation.

Costs and returns for several crops that might be replaced by sugarbeets are presented in Table 7.[11]

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[10]The Sugar Act of 1948 as Amended, Title II, Sec. 201.

[11]Schaffner, LeRoy W., Billy B. Rice, and Roger G. Johnson, Crop Costs and Returns, Circular A-550, A-553, and A-558, Cooperative Extension Service, North Dakota State University, Fargo, 1971.

TABLE 6. SUGARBEET PRODUCTION COSTS AND RETURNS FOR ONE ACRE OF SUGARBEETS AND ONE ACRE OF SUMMER FALLOW, 200-ACRE ALLOTMENT--FIRST, SECOND, AND FOURTH YEAR OF COOPERATIVELY OWNED PLANT OPERATIONS

	Year of Operation		
	1st Year	2nd Year	4th Year
Yield in Tons	12.5	12.5	12.5
Price	$ 16.68	$ 17.19	$ 17.79
Gross Income	$208.50	$214.87	$222.37
Direct Costs	79.95	79.95	79.95
Return Over Direct Costs	$128.55	$134.92	$142.42
Fixed Costs	59.85	59.85	59.85
Interest on Cooperative Stock Investment[a]	13.20	13.20	13.20
Labor and Management Return			
Total (2 acres)	55.50	61.87	69.37
Per Acre of Land	27.75	30.93	34.68

[a]In addition to the annual interest there is an interest cost of $13.42 an acre due to the fact that the stock investment has to be made more than a year in advance. This interest has not been allocated.

TABLE 7. COSTS AND RETURNS FOR SMALL GRAINS AND SUNFLOWERS, RED RIVER VALLEY

Crop	Wheat on Fallow	Wheat	Barley	Oil Seed Sunflowers
Yield Per Acre	41 bu.	36 bu.	53 bu.	12.7 cwt.
Price	$ 1.45	$ 1.45	$ .90	$ 4.20
Gross Income	59.45	54.00	47.70	53.34
Direct Costs	15.82	17.51	17.08	12.43
Return Above Direct Costs	43.63	34.69	30.62	40.91
Fixed Costs				
Machinery	9.38	7.14	7.14	7.13
Land	40.00	20.00	20.00	20.00
Labor and Management Return				
Total	5.75	7.55	3.48	13.78
Per Acre of Land	2.87	7.55	3.48	13.78
Hours of Operator Labor	2.75 hr.	1.79 hr.	1.79 hr.	1.97 hr.

SOURCE: Crop Costs and Returns, Circular A-550, A-553, and A-558, Schaffner, LeRoy W., Billy B. Rice, and Roger G. Johnson, Cooperative Extension Service, North Dakota State University, 1971.

Effect of Sugarbeet Enterprise Upon Cash Flow

This portion of the report will analyze the effect of adding a sugarbeet enterprise to an existing cropping program built around small grain production. A substitution budget will be used to show the changes in cash income brought about by adding the sugarbeet enterprise.

A farm cash flow analysis is made to determine if the additional cash income is sufficient to cover increased interest, principal, and income tax payments resulting from the addition of the sugarbeet enterprise. Projections will be made for the first, second, and fourth year of operation of the cooperatively owned processing plant.

The initial situation will assume a 1,200-acre farm to which a 200-acre sugarbeet enterprise using hand labor will be added. It will be assumed that 20 percent of the land will be summer fallowed, both with and without sugarbeets. The sugarbeets will all be produced on summer-fallowed land and will replace some of the wheat and barley acreage. The acreage of other crops, such as flax, sunflowers, and alfalfa, will be left unchanged. It will be assumed that operator and family labor is fully utilized at peak labor periods before the sugarbeet enterprise is added. Hired labor, to cover the added labor needs, has been included as a direct cost for the sugarbeet budgets presented in Table 4.

The change in return above direct cost due to substituting 200 acres of sugarbeets for small grains is presented in Table 8.

TABLE 8. COMPARISON OF RETURNS ABOVE DIRECT COSTS WITH AND WITHOUT A SUGARBEET ENTERPRISE ON 200 ACRES, HAND LABOR METHOD OF PRODUCTION--FIRST, SECOND, AND FOURTH YEAR OF OPERATION OF COOPERATIVELY OWNED PROCESSING PLANT

Crop	Acres	Returns Above Direct Cost/Acre	Total
Without Sugarbeets			
Wheat on Fallow	240	43.63	$10,471.20
Wheat on Nonfallow	194	34.69	6,729.86
Barley	354	30.62	10,839.48
Summer Fallow	240	--	--
Other Crops	172	No change due to adding sugarbeets	
TOTAL	1,200		$28,040.54
With Sugarbeets			
Wheat on Fallow	40	43.63	$ 1,745.20
Barley	264	30.62	8,083.68
Sugarbeets	200	1st year 128.55	25,710.00
		2nd year 134.92	26,984.00
		4th year 142.42	28,484.00
Wheat on Nonfallow	284	34.69	9,851.96
Summer Fallow	240	--	--
Other Crops	172	no change due to adding sugarbeets	
TOTAL	1,200	Total 1st year	$45,390.84
		2nd year	46,664.84
		4th year	48,164.84
Increase in cash available for interest and principal payments on new investment:		1st year	$17,350.30
		2nd year	18,624.30
		4th year	20,124.30

The additional cash generated by the sugarbeet enterprise is needed to make interest and principal payments on the new investment required. It will be assumed that the investment in sugarbeet machinery and housing will be amortized over a five-year period. An 8 percent interest rate will be used. The annual payment using an equal payment amortization would be as follows:

Method of Production	Investment	Annual Repayment
Hand Labor	$27,891	$6,986.70
Thinner and Hand Labor	35,384	8,863,69
All Mechanized	31,984	8,011.99

In addition to amortizing the investment in additional equipment, the increased cash flow will be needed to repay the farmer's investment in the processing plant. Assuming a repayment rate of $2 per ton or $25 per acre with average yields, the annual payment on 200 acres of sugarbeets would be $5,000.

The cash flow consequences of substituting a 200-acre sugarbeet enterprise for small grain production are summarized in Table 9. Included in this summary are the effects of additional federal and state income taxes paid on income generated by the beet enterprise.

TABLE 9. CASH FLOW FOR A 200-ACRE SUGARBEET ENTERPRISE--FIRST, SECOND, AND FOURTH YEAR OF SALE TO COOPERATIVELY OPERATED SUGARBEET PLANT

Cash Flow Item	Year of Operation		
	1st Year	2nd Year	4th Year
Added Return Over Direct Cost	$17,350.30	$18,624.30	$20,124.30
Amortization of Machinery and Housing-Hand Labor Method	6,986.70	6,986.70	6,986.70
Amortization of Investment in Cooperatively Owned Plant	5,000.00	5,000.00	5,000.00
Cash Generated Before Income Tax	5,363.60	6,637.60	8,137.60
Additional Income Tax Payment[a]	2,310.90	2,755.50	3,332.70
Cash Generated After Income Tax	$ 3,052.70	$ 3,882.10	$ 4,804.90

[a]Assumes a 30 percent tax rate on added taxable income. Tax is for first year.

The additional taxable income generated is determined by subtracting interest payments and depreciation from the returns above direct costs generated by the sugarbeet enterprise. With rapid depreciation rates, depreciation on sugarbeet equipment would about equal the principal payments on machinery budgeted in the cash flow. Interest on money borrowed to buy stock in the cooperative is also deductible. Interest on producers' investment in the processing plant would decrease each year as a larger portion of the payment would be used to reduce the principal on the loan. It is assumed that interest is paid each year as it accrues including the years prior to plant operation.

The marginal tax rate will depend upon the individual producer's income level, personal deductions, and number of exemptions. For this study an initial taxable income of $10,000, the standard deductions, and five exemptions are used The additional taxable income due to the sugarbeet enterprise will average about $9,000 over the first four years. The combined federal and North Dakota tax rate on the added income would begin at 22 percent and increase to a marginal rate of 35 percent with an average of 30 percent.[12,13]

Another tax liability will result from the cooperative sugarbeet processing plant operations. Earnings of the cooperative will be paid to producers as patronage dividends. These dividends are taxable in the year received. However, 20 percent of the patronage dividend must be paid in cash, and would pay the majority of the additional income tax liability. The projected net income of the sugarbeet factory indicates no net income until the fourth year of operation.[14]

The calculations presented in Table 9 indicate that a 200-acre sugarbeet enterprise can meet the projected cash flow needs using average prices and yields. Some creditors may want a more rapid repayment of loans made to purchase stock in the cooperative. The maximum per ton assignment that could be made and still not reduce the producers' cash flow position can also be calculated. This is found by taking the added return over direct costs and subtracting cash withdrawal for machinery and added income tax payments and dividing the result by the average production on 200 acres. The results for the first, second, and fourth year of production are as follows:

Year	Maximum Per Ton Assignment Available from Cash Flow Generated
1st	(8,053 ÷ 2,500 tons) $3.22
2nd	(8,882 ÷ 2,500 tons) $3.55
4th	(9,805 ÷ 2,500 tons) $3.92

Variability in Yields and Prices

The effect of variability in yields on cash flow should also be considered. One approach to this problem is to determine the minimum yield necessary to cover the cash flow requirements at the planned loan repayment rate. The minimum yields which may occur and still cover the cash flow projections are:

First year of plant operation	10.93 tons/acre
Second year of plant operation	10.60 tons/acre
Fourth year of plant operation	10.27 tons/acre

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[12]1971 Federal Income Tax Forms, Department of the Treasury, Internal Revenue Service, Washington, D.C.

[13]North Dakota Individual Income Tax Return for Tax Year Beginning January 1, 1971, Tax Commissioner, Bismarck, North Dakota.

[14]Red River Valley Cooperative, Inc., op. cit.

The minimum price that may accure and still cover the cash flow projections assuming average yields have also been calculated. The results indicate that a price (including government payments) of $15 per ton would be the minimum necessary. This break-even price is essentially the same each of the first four years of plant operation.

These calculations assume production costs do not change with yield and price and also that creditors will take the same per ton assignment to cover the grower's investment in the plant.

Yields per planted acre since 1958 in Cass, Grand Forks, and Traill counties have ranged from a low of 9.3 tons to a high of 17.0 tons. The standard deviation in yields for all three counties over the 14-year period is 1.8 tons. This means that the expected range in yields in two-thirds of the years would be from 10.7 to 14.3 tons per acre. Therefore, it should be expected that about 1/6 of the years' yields will not be sufficient to meet the projected cash flows. This would indicate that lenders may have to extend the term of credit lines used for the sugarbeet enterprise in the lowest yield years.

Summary

This analysis indicates that both cash flow and net returns to growers will be enhanced by participation in the operation of the proposed sugar processing cooperative. Net returns appear to be substantially improved over the existing cropping alternatives when the sugarbeet enterprise is added to a hypothetical farming operation in the plant area.

Because of the required investment in new machinery and the purchase of $165 worth of stock per acre, cash income demands are quite high during the early years of operation when these debts are to be retired. This analysis indicates that if yields drop below 11 tons per acre or if prices received by the producer drop below $15 per ton, cash flow demands cannot be met out of income generated by the beet enterprise. This study has not analyzed plant operations or sugar market prices in depth and, therefore, has not attempted to project income variations that could result from changes in either of these factors.

Appendix

APPENDIX TABLE 1. MACHINERY INVESTMENT FOR 130 ACRES OF SUGARBEETS

	Hand Labor	Thinner and Hand Labor	All Mechanized
12-Row Planter	$ 3,375	$ 3,375	$ 3,375
12-Row Cultivator	1,962	1,962	1,962
Rotobeater-Scalper (2/3 owned)	2,170	2,170	2,170
Lifter (1/2 owned)	3,925	3,925	3,925
Truck Used 2 1/2 Ton Tandem	6,500	6,500	6,500
Thinner (2/3 owned)		4,995	4,995
Housing	2,267	2,267	
TOTAL INVESTMENT	$20,199	$25,194	$22,927

APPENDIX TABLE 2. SUGARBEET PRODUCTION COST PER ACRE FOR 130 ACRES OF BEETS

Cost Input	Hand Labor	Thinner and Hand Labor	All Mechanized
Direct Cost			
Seed	$ 3.75	$ 3.75	$ 3.75
Fertilizer	8.30	8.30	8.30
Chemical	4.45	4.45	15.80
Hired Labor @ $2/Hour	11.34	11.49	11.59
Contract Labor	26.50	12.00	0.00
Machine Repair			
Fallow Year	1.95	1.95	1.95
Crop Year	5.80	6.30	6.45
Fuel, Grease, and Oil			
Fallow Year	1.30	1.30	1.30
Crop Year	9.00	9.55	9.70
Custom and Lease Cost	3.90	3.90	3.90
Building Repair and Utilities	.55	.55	0.00
Miscellaneous	5.20	5.20	5.20
Interest on Operating Capital	3.30	2.75	2.70
TOTAL DIRECT COST	$ 85.34	$ 71.49	$ 70.64
Fixed Cost			
Machinery Depreciation			
Fallow Year	$ 1.70	$ 1.70	$ 1.70
Crop Year	9.45	15.45	15.65
Machinery Interest on Investment			
Fallow Year	2.05	2.05	2.05
Crop Year	7.80	9.70	9.85
Housing Ownership	1.10	1.10	0.00
Land Charge	40.00	40.00	40.00
TOTAL FIXED COST	$ 61.95	$ 69.85	$ 69.25
Total Cost of Production	$147.29	$141.49	$139.89
Hours of Operator Labor	2.75 hr.	2.75 hr.	2.75 hr.

APPENDIX TABLE 3. AVERAGE YIELD OF SUGARBEETS PER PLANTED ACRE, 10 RED RIVER VALLEY COUNTIES, 1967-1971

County	Year					Average
	1967	1968	1969	1970	1971	
Cass	12.1	13.5	14.8	12.3	17.0	13.9
Grand Forks	10.5	12.5	14.4	10.6	15.2	12.6
Pembina	9.8	11.8	12.5	10.3	13.4	11.6
Traill	10.0	11.8	15.0	9.9	14.9	12.3
Walsh	9.6	13.2	13.3	11.1	15.7	12.6
Clay	11.0	14.0	15.3	11.1	15.3	13.3
Kittson	7.7	11.7	11.5	10.5	15.1	11.3
Marshall	8.8	11.2	11.8	9.2	15.3	11.3
Norman	11.0	14.0	14.7	9.9	15.8	13.1
Polk	10.7	12.8	14.6	10.9	15.1	12.8
10-County Average	10.1	12.6	13.8	10.6	15.3	12.5

SOURCE: North Dakota Crop and Livestock Reporting Service, United States Department of Agriculture, Fargo, North Dakota, and Agricultural Stabilization and Conservation Service, United States Deparment of Agriculture.

APPENDIX TABLE 4. AVERAGE PRICE RECEIVED FOR SUGARBEETS, NORTH DAKOTA AND MINNESOTA--1967-1971

	Year					Average
	1967	1968	1969	1970	1971	
North Dakota						
Government Payment	$ 2.29	$ 2.30	$ 2.29	$ 2.25	$ 2.25	
Market Price	14.40	13.20	13.90	14.60	—	
TOTAL	$16.69	$15.50	$16.19	$16.85	$17.25[a]	$16.50
Minnesota						
Government Payment	$ 2.23	$ 2.25	$ 2.22	$ 2.22	$ 2.25	
Market Price	14.50	13.00	13.90	14.30	--	
TOTAL	$16.73	$15.25	$16.12	$16.52	$17.25[a]	$16.37
Two State Five-Year Average						$16.44

[a]Estimate based upon sugar content and price through May, 1972.